We Claim:

1. An improved phosphor for a thick film electroluminescent display, said phosphor comprising;

- a thin film rare earth metal activated zinc sulfide phosphor, wherein said phosphor is fine grained.

2. The phosphor of claim 1, wherein said zinc sulfide phosphor has a crystal grain dimension of up to about 50nm.

3. The phosphor of claim 2, wherein said zinc sulfide phosphor has a crystal grain dimension selected from the group consisting of about 20nm to about 50nm, about 30nm to about 50nm and about 40nm to about 50nm.

4. The phosphor of claim 3, wherein said rare earth metal activated zinc sulfide phosphor layer has the formula ZnS:RE, wherein RE is a selected from the group consisting of terbium and europium.

5. The phosphor of claim 4, wherein the atomic ratio for terbium or europium to zinc is about 0.005 to 0.02.

6. The phosphor of claim 5, wherein said zinc sulfide phosphor has a sphalerite crystal structure.

7. The phosphor of claim 5, wherein said zinc sulfide phosphor is provided as a thin layer with a thickness of about 0.5 to about 1.0 μm.

8. The phosphor of claim 7, wherein said zinc phosphor is deposited by a method selected from the group consisting of chemical vapour deposition, electron beam deposition and sputtering.

9. The phosphor of claim 8, wherein said phosphor is deposited by a sputtering process comprising;

- depositing said phosphor onto a substrate in an atmosphere comprising argon at a working pressure in the range of about 0.5 to 5 x 10^{-2} torr and an oxygen partial pressure of less than about 0.05 of the working pressure, said substrate maintained at a temperature between ambient temperature and about 300°C, at a deposition rate in the range of about 5 to 100 Angstroms per second, wherein the atomic ratio of the rare earth metal to zinc in the source material is in the range of about 0.5 to 2 percent.

10. The phosphor of claim 8 provided within an electroluminescent device further comprising;

- a structure and/or substance to minimize or prevent reaction of said fine grained phosphor with oxygen.

11. The phosphor of claim 10, wherein said structure or substance comprises one or more of;

i) interface modifying layers on one or both sides of the phosphor film to improve the stability of the interface between the phosphor film and the rest of the device;

ii) a hermetic enclosure for the electroluminescent device; and

iii) an oxygen getter incorporated into the device.

12. The phosphor of claim 11, wherein said interface modifying layer is selected from a material selected from the group consisting of pure

zinc sulfide, hydroxyl ion free alumina, aluminum nitride, silicon nitride and aluminum oxide that is deposited using atomic layer epitaxy.

13. The phosphor of claim 12, wherein said interface modifying layer is silicon nitride.

14. The phosphor of claim 12, wherein said interface modifying layer is pure zinc sulfide.

15. The phosphor of claim 11, wherein said hermetic enclosure is an optically transparent cover plate disposed over said device.

16. The phosphor of claim 15, wherein said cover plate consists of glass .

17. The phosphor of claim 16, wherein said cover plate is sealed with a sealing bead formed using glass frit.

18. The phosphor of claim 16, wherein said sealing bead comprises a polymeric material.

19. The phosphor of claim 11, wherein said hermetic enclosure is an oxygen-impermeable sealing layer deposited over said device.

20. The phosphor of claim 19, wherein said oxygen-impermeable sealing layer is of glass formed from a glass frit composition.

21. A thick film dielectric electroluminescent device comprising;

- a thin phosphor layer of formula ZnS:Re, wherein said phosphor layer has a crystal grain size of up to about 50nm and Re is selected from terbium and europium; and

- a structure and/or substance to minimize or prevent reaction of the fine grained phosphor with oxygen, wherein said structure or substance comprises one or more of;

i) interface modifying layers on one or both sides of the phosphor film to improve the stability of the interface between the phosphor film and the rest of the device;

ii) a hermetic enclosure for the electroluminescent device; and

iii) an oxygen getter incorporated into the device.

22. The device of claim 21, wherein the atomic ratio for terbium or europium to zinc is about 0.005 to 0.02.

23. The device of claim 22, wherein said zinc sulfide phosphor layer has a crystal grain dimension selected from the group consisting of about 20nm to about 50nm, about 30nm to about 50nm and about 40nm to about 50nm.

24. The device of claim 23, wherein said zinc sulfide phosphor layer has a sphalerite crystal structure.

25. The device of claim 23, wherein said zinc sulfide phosphor layer has a thickness of about 0.5 to about 1.0 μm.

26. The device of claim 25, wherein said zinc sulfide phosphor layer is deposited by a method selected from the group consisting of chemical vapour deposition, electron beam deposition and sputtering.

27. The device of claim 26, wherein said structure is deposited by a sputtering process and comprises

- depositing said phosphor layer onto a substrate in an atmosphere comprising argon at a working pressure in the range of about 0.5 to 5 x 10^{-2} torr and an oxygen partial pressure of less than about 0.05 of the working pressure, said substrate maintained at a temperature between ambient temperature and about 300°C, at a deposition rate in the range of about 10 to 100 Angstroms per second, wherein the atomic ratio of the rare earth metal to zinc in the source material is in the range of about 0.5 to 2 percent .

28. The device of claim 27, wherein said interface modifying layer is selected from a material selected from the group consisting of pure zinc sulfide, hydroxyl ion free alumina, aluminum nitride, silicon nitride and aluminum oxide that deposited using atomic layer epitaxy.

29. The device of claim 28, wherein said interface modifying layer is zinc sulfide.

30. The device of claim 29, wherein said interface modifying layer is silicon nitride.

31. The device of claim 30, wherein said phosphor layer is deposited on a substrate selected from a thick dielectric layer deposited on glass and a thick dielectric layer deposited on ceramic.

32. A method for depositing and stabilizing a fine grained rare earth metal activated zinc sulfide phosphor, said method comprising;

- providing an interface modifying layer adjacent one or both sides of said phosphor.

33. The method of claim 32, wherein said interface modifying layer is selected from a material selected from the group consisting of pure zinc sulfide, hydroxyl ion free alumina, aluminum nitride, silicon nitride and aluminum oxide that deposited using atomic layer epitaxy.

34. The method of claim 33, wherein said interface modifying layer is zinc sulfide.

35. The method of claim 34, wherein said interface modifying layer is silicon nitride.

36. The method of claim 35, wherein said rare earth metal activated zinc sulfide phosphor has the formula ZnS:RE, wherein RE is a selected from the group consisting of terbium and europium.

37. The method of claim 36, wherein said zinc phosphor has a crystal grain dimension of up to about 50nm.

38. The method of claim 36, wherein the atomic ratio for terbium or europium to zinc is about 0.005 to 0.02.

39. The method of claim 38, wherein said zinc sulfide phosphor has a crystal grain dimension selected from the group consisting of about 20nm to about 50nm, about 30nm to about 50nm and about 40nm to about 50nm.

40. The method of claim 37, wherein said zinc sulfide phosphor has a sphalerite crystal structure.

41. The method of claim 39, wherein said zinc sulfide phosphor layer has a thickness of about 0.5 to about 1.0 μm.

42. A thick film dielectric electroluminescent device comprising;

- a 0.5 to 1.0μm thick phosphor layer of formula ZnS:Re, wherein said phosphor layer has a sphalerite crystal structure with a crystal grain size of up to about 50nm and Re is selected from terbium and europium; and

i) interface modifying layers on one or both sides of the phosphor film to improve the stability of the interface between the phosphor film and the rest of the device, wherein said interface modifying layers are comprised of pure zinc sulfide or silicon nitride.

43. The device of claim 42, wherein said device additionally comprises a hermetic enclosure over said device.

44. The device of claim 43, wherein said device additionally comprises an oxygen getter.